2002 STANDARD DRAWINGS

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Change Four, July 14, 2003

Memorandum UTAH DEPARTMENT OF TRANSPORTATION

DATE: July 14, 2003

TO: Region Directors
Project Engineers
Project Design Engineers
Project Managers
Consultants and Contractors

FROM: Barry Axelrod, CDT
Standards and Specifications

SUBJECT: Standard Drawing [U.S. Standard Unit (Inch-Pound Units)] Change 4 Dated July 14, 2003

A new index and updated drawings are attached. Please take the following action with respect to the attached pages.

REMOVE	**INSERT**
Index	Index - revised
Sheet 1B	Sheet 1B - revised
Sheet 1C	Sheet 1C - revised
N/A	DD 1 - new
N/A	DD 3 - new
N/A	DD 8 - new
N/A	DD 9 - new
N/A	DD 10 - new
N/A	DD 11 - new
N/A	DD 12 - new
N/A	DD 13 - new
GW 2	GW 2 - Revised

Electronic files for all Standards Drawings are available from the Standards and Specifications Web page on the Internet. The files are in Adobe pdf format.

If you have any questions or problems with the electronic files contact me at (801) 964-4570 or by email at baxelrod@utah.gov.

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UTAH DEPARTMENT OF TRANSPORTATION

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U	NUMBER	TITLE	CURRENT DATE
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	SL 5	Breakaway Post Mounted Traffic Signal Pole	07/03/02
	SL 6	Power Source Details	07/03/02
	SL 7	Span Wire Signal Pole Detail	07/03/02
	SL 8	Signal Head Details	07/03/02
	SL 9	Pedestrian Signal Assembly	07/03/02
	SL 10	Controller Base Details	07/03/02
	SL 11	Traffic Signals Loop Detector Detail	07/03/02
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	SN 9	Ground Mounted Tubular Steel Sign Post (P2)	07/03/02
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	SW 3B	Precast Concrete Noise Wall 2 of 2	12/19/02
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Listing of Revised Standard Drawings

Change Four

Revised June 26, 2003

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DD 3	Climbing Lanes	06/26/2003
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DD 10	Railroad Clearances At Highway Overpass Structures	06/26/2003
DD 11	Rural Multi Lane Highways Other Than Freeways	06/26/2003
DD 12	Rural Two Lane Highways	06/26/2003
DD 13	Frontage and Access Roads (Under 50 ADT)	06/26/2003
GW 2	Concrete Curb & Gutter	06/26/2003

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

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AT 2	RAMP METER DETAILS	07-03-02
AT 3	RAMP METER SIGN PANEL	07-03-02
AT 4	TYPICAL RAMP METER SIGNAL HEAD MOUNTING	07-03-02
AT 5	LOOP INSTALLATION	07-03-02
AT 6	CONDUIT DETAILS	07-03-02
AT 7	POLYMER-CONCRETE JUNCTION BOX DETAILS	04-24-03
AT 8	ATMS CABINET W/120V DISCONNECT	07-03-02
AT 9	ATMS CAB WITH STEPDOWN TRANSFORMER	07-03-02
AT 10	DOMED CCTV DETAILS	07-03-02
AT 11	CCTV POLE DETAIL	07-03-02
AT 12	CCTV POLE FOUNDATION FOR DEDICATED CCTV POLE	07-03-02
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CB 3	STANDARD TRANSITION CONCRETE LINED DITCH TO PIPE OR DIVERSION BOX	07-03-02
CB 4	SOLID COVER FOR STD DWG DB 1 MS-18 LOADING	07-03-02
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CB 9B	STANDARD CATCH BASIN AND CLEANOUT BOX SECTION DETAILS	07-03-02
CB 9C	STANDARD CATCH BASIN AND CLEANOUT BOX SCHEDULE OF INSTALLATION 18" TO 42" RCP 12" TO 48" CMP	07-03-02
CB 9D	STANDARD CATCH BASIN AND CLEANOUT BOX SCHEDULE OF INSTALLATION 48" TO 66" RCP 60" TO 78"CPM	07-03-02
CB 10A	STANDARD CATCH BASIN AND CLEANOUT BOX SITUATION & LAYOUT	07-03-02
CB 10B	STANDARD CATCH BASIN AND CLEANOUT BOX SECTION DETAILS	07-03-02
CB 10C	STANDARD CATCH BASIN AND CLEANOUT BOX SCHEDULE OF INSTALLATION 42" TO 60" RCP 48" TO 72" CMP	07-03-02
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CC 3	CRASH CUSHION DRAINAGE DETAILS GUIDELINE B	07-03-02
CC 4	DETAIL FOR PLACEMENT CRASH CUSHIONS TYPE A, B & D	07-03-02
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CC 8	GRADING & INSTALLATION DETAILS CRASH CUSHION TYPE G	04-24-03
CC 9A	GRADING & INSTALLATION DETAILS CRASH CUSHION TYPE H	04-24-03
CC 9B	GRADING & INSTALLATION DETAILS CRASH CUSHION TYPE H	04-24-03
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DB 1B	STANDARD DIVERSION BOX HINGED LID DETAIL FOR 18" DIA OR 24" DIA.PIPE	07-03-02
DB 1C	STANDARD DIVERSION BOX BICYCLE-SAFE GRATING DETAILS FOR 18"DIA. OR 24"DIA.PIPE	07-03-02
DB 1D	STANDARD DIVERSION BOX THREE GATE BOX SECTIONS FOR 18"DIA. OR 24"DIA.PIPE	07-03-02
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DB 3B	STANDARD DIVERSION BOX WITH MANHOLE COVER UP TO 42" RCP AND UP TO 54" CMP	07-03-02
DB 3C	STANDARD DIVERSION BOX WITH MANHOLE COVER 48"TO 72" RCP AND 60"TO 84" CMP	07-03-02
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DD 9	STRUCTURAL GEOMETRIC DESIGN STANDARDS	06-26-03
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DG 3	MAXIMUM FILL HEIGHT AND END SECTIONS FOR HDPE AND PVC PIPES	12-19-02
DG 4	PIPE CULVERTS MINIMUM COVER	12-19-02
DG 5	PLASTIC PIPE, METAL PIPE OR PIPE ARCH CULVERT BEDDING	07-03-02
DG 6	PRECAST CONCRETE PIPE CULVERT	07-03-02
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EN 4	TEMPORARY EROSION CONTROL (DROP INLET BARRIERS)	12-19-02
EN 5	TEMPORARY EROSION CONTROL (SEDIMENT TRAP AND CURB INLET BARRIER)	07-03-02
	Fence and Gates (FG)	
FG 1A	RIGHT OF WAY FENCE AND GATES (WOOD POST)	07-03-02
FG 1B	RIGHT OF WAY FENCE AND GATES (WOOD POST)	07-03-03
FG 2A	RIGHT OF WAY FENCE AND GATES (METAL POST)	07-03-02
FG 2B	RIGHT OF WAY FENCE AND GATES (METAL POST)	07-03-02
FG 3	SWING GATES TYPE 1 FOR GATES LESS THAN 17'	07-03-02
FG 4	DEER GATES	07-03-02
FG 5	SWING GATES TYPE II FOR GATES WIDER THAN 17'	07-03-02
FG 6	CHAIN LINK FENCE	07-03-02

☒ MARKED BOXES INDICATE DRAWINGS APPLICABLE TO THIS PROJECT

REVISIONS

NO.	DATE	APPR.	REMARKS
1	02/19/03	B.A.	CHANGE 1
2	04/24/03	B.A.	CHANGE 3
3	06/26/03	B.A.	CHANGE 4

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

REVIEWED AND CHECKED — JUN.26.2003 DATE

CHECKED AND APPROVAL — JUN.26.2003 DATE

STANDARD ENGINEER

STANDARD DRAWING INDEX SHEET

STANDARD DRAWING TITLE

STD DWG
1-B

DGN File: N:\Esd\Standard Drawings\Imperial\Approved\Change4\Approved\sheet1b.dgn
15-JUL-2003

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

DWG. NO.	DESCRIPTION	DATE
	Grates, Frames and Trash Racks (GF)	
GF 1	MANHOLE FRAME AND GRATED COVER	07-03-02
GF 2	MANHOLE FRAME AND SOLID COVER	07-03-02
GF 3	RECTANGULAR GRATE & FRAME	07-03-02
GF 4	DIRECTIONAL FLOW GRATE & FRAME	07-03-02
GF 5	SOLID COVER & FRAME	07-03-02
GF 6	MANHOLE STEPS	07-03-02
GF 7	STANDARD SCREW GATE & FRAME	07-03-02
GF 8	2' x 2' GATE AND FRAME	07-03-02
GF 9	28" x 24" DIRECTIONAL FLOW GRATE AND FRAME	07-03-02
GF 10	STANDARD TRASH RACKS 90° ANGLE X-ING L	07-03-02
GF 11	STANDARD TRASH RACKS	07-03-02
GF 12	STANDARD TRASH RACKS	07-03-02
	General Road Work (GW)	
GW 1	RAISED MEDIAN AND PLOWABLE END SECTION	12-19-02
GW 2	CONCRETE CURB AND GUTTER	06-26-03
GW 3	CONCRETE CURB AND GUTTER DETAILS	07-03-02
GW 4	CONCRETE DRIVEWAYS AND SIDEWALKS	07-03-02
GW 5	PEDESTRIAN ACCESS	02-27-03
GW 6	RIGHT OF WAY MARKER	07-03-02
GW 7	NEWSPAPER AND MAILBOX STOP LAYOUT	07-03-02
GW 8	NEWSPAPER AND MAILBOX SUPPORT HARDWARE	07-03-02
GW 9	DELINEATION HARDWARE	07-03-02
GW 10	DELINEATION APPLICATION	07-03-02
	Paving (PV)	
PV 1	JOINTS FOR HIGHWAYS WITH CONCRETE TRAFFIC LANES AND SHOULDERS	07-03-02
PV 2	PAVEMENT/APPROACH SLAB DETAILS	12-19-02
PV 3	CONCRETE PAVEMENT DETAILS FOR URBAN AND INTERSTATE	07-03-02
PV 4	CONCRETE PAVEMENT DETAILS FOR URBAN AND INTERSTATE	07-03-02
PV 5	URBAN CONCRETE PAVEMENT DETAILS	07-03-02
PV 6	RUMBLE STRIPS	07-03-02
PV 7	RUMBLE STRIPS -TYPICAL APPLICATION	07-03-02
	Signals (SL)	
SL 1	TRAFFIC SIGNALS MAST ARM POLE AND LUMINAIRE EXTENSION	07-03-02
SL 2	TRAFFIC SIGNALS MAST ARM DETAIL 25' THRU 65'	07-03-02
SL 3	UNDERGROUND SERVICE PEDESTAL DETAIL	07-03-02
SL 4	TRAFFIC SIGNALS MAST ARM POLE FOUNDATION	07-03-02
SL 5	BREAKAWAY POST MOUNTED TRAFFIC SIGNAL POLE	07-03-02
SL 6	POWER SOURCE DETAILS	07-03-02
SL 7	SPAN WIRE SIGNAL POLE DETAIL	07-03-02
SL 8	SIGNAL HEAD DETAILS	07-03-02
SL 9	PEDESTRIAN SIGNAL ASSEMBLY	07-03-02
SL 10	CONTROLLER BASE DETAIL	07-03-02
SL 11	TRAFFIC SIGNALS LOOP DETECTOR DETAIL	07-03-02
SL 12	JUNCTION BOX DETAILS	07-03-02
SL 13	TRAFFIC COUNTING LOOP DETECTOR DETAIL	12-19-02
SL 14	LIGHT POLE BREAKAWAY BASE	07-03-02
SL 15	LUMINARIE BREAKAWAY BASE DETAIL	07-03-02
SL 16	SINGLE TRANSFORMER SUBSTATION DETAILS	07-03-02
SL 17	LIGHT POLE ANCHOR BASE	07-03-02
SL 18	LIGHT POLE FOUNDATION EXTENSION	07-03-02
	SIgns (SN)	
SN 1	BRIDGE LOAD LIMITS SIGNS	07-03-02
SN 2	FLASHING SCHOOL SIGN	12-19-02
SN 3	OVERHEAD SCHOOL FLASHER	07-03-02
SN 4	FLASHING STOP SIGN	12-19-02
SN 5	TYPICAL INSTALLATION FOR MILEPOST SIGNS	12-19-02
SN 6	NOT USED	07-03-02
SN 7	PLACEMENT OF GROUND MOUNTED SIGNS	07-03-02
SN 8	GROUND MOUNTED TIMBER SIGN POST (P1)	12-19-02
SN 9	GROUND MOUNTED TUBULAR STEEL SIGN POST (P2)	07-03-02
SN 10	GROUND MOUNTED SQUARE STEEL SIGN POST (P3)	07-03-02
SN 11	SLIPBASE GROUND MOUNTED TUBULAR STEEL SIGN POST (P-4)	07-03-02
SN 12A	GROUND MOUNTED SIGN INSTALLATION DETAILS	07-03-02
SN 12B	GROUND MOUNTED SIGN INSTALLATION DETAILS	04-24-03
SN 12C	GROUND MOUNTED SIGN INSTALLATION DETAILS	07-03-02
	Striping (ST)	
ST 1	OBJECT MARKERS "T" INTERSECTION & PAVEMENT TRANSITION GUIDANCE	12-19-02
ST 2	FREEWAY TURN AROUND MARKINGS	07-03-02
ST 3	TYPICAL PAVEMENT MARKINGS	07-03-02
ST 4	CROSSWALKS, PARKING AND INTERSECTION APPROACHES	07-03-02
ST 5	PAINTED MEDIAN & AUXILIARY LANE DETAILS	07-03-02
ST 6	PASSING/CLIMBING LANES TRAFFIC CONTROL	07-03-02
ST 7	PAVEMENT MARKINGS AND SIGNS AT RAILROAD CROSSING	12-19-02
ST 8	PLOWABLE PAVEMENT MARKERS	07-03-02
	Structures and Walls (SW)	
SW 1A	WELDED END GUARD UNIT	07-03-02
SW 1B	PRECAST CONCRETE CATTLE GUARD	07-03-02
SW 2	NOISE WALL PLACEMENT AREA	07-03-02
SW 3A	PRECAST CONCRETE NOISE WALL 1 OF 2	12-19-02
SW 3B	PRECAST CONCRETE NOISE WALL 2 0F 2	12-19-02
SW 4A	PRECAST CONCRETE RETAINING/NOISE WALL 1 OF 2	12-19-02
SW 4B	PRECAST CONCRETE RETAINING/NOISE WALL 2 OF 2	07-03-02
	Traffic Control (TC)	
TC 1A	CONSTRUCTION ZONE CHANNELIZATION DEVICES	07-03-02
TC 1B	CONSTRUCTION ZONE SIGNING	07-03-02
TC 2A	TRAFFIC CONTROL GENERAL	07-03-02
TC 2B	TRAFFIC CONTROL GENERAL	07-03-02
TC 3	TRAFFIC CONTROL PROJECT LIMIT SIGNING	07-03-02
TC 4	TRAFFIC CONTROL URBAN INTERSECTION WITH ROADWAYS UNDER 50 MPH	07-03-02
TC 5	TRAFFIC CONTROL URBAN INTERSECTION WITH ROADWAYS UNDER 50 MPH	07-03-02
TC 6	TRAFFIC CONTROL PEDESTRIAN ROUTING	07-03-02
TC 7	TRAFFIC CONTROL ROAD CLOSURE, DETOUR	07-03-02
TC 8	TRAFFIC CONTROL LANE CLOSURE	07-03-02
TC 9	TRAFFIC CONTROL MULTILANE CLOSURE	07-03-02
TC 10	TRAFFIC CONTROL EXPRESSWAY AND FREEWAY CROSSOVER/ TURN AROUND	07-03-02
TC 11	TRAFFIC CONTROL EXIT RAMP GORE	07-03-02
TC 12	TRAFFIC CONTROL ENTRANCE RAMP GORE	07-03-02
TC 13	TRAFFIC CONTROL SHOULDER-HAUL ROAD	07-03-02
TC 14	TRAFFIC CONTROL FLAGGING OPERATION	07-03-02
TC 15	TRAFFIC CONTROL 2 LANE / 2 WAY SEAL COAT WITH COVER MATERIAL	07-03-02
TC 16	TRAFFIC CONTROL PAVEMENT MARKING	07-03-02

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STD DWG
1-C

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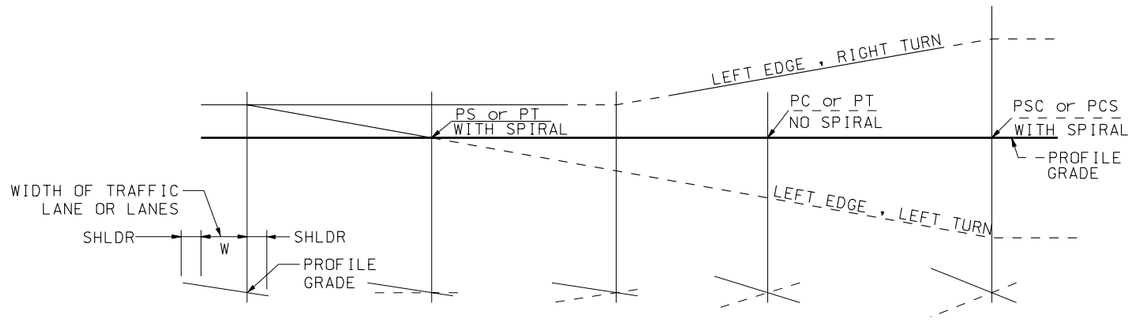
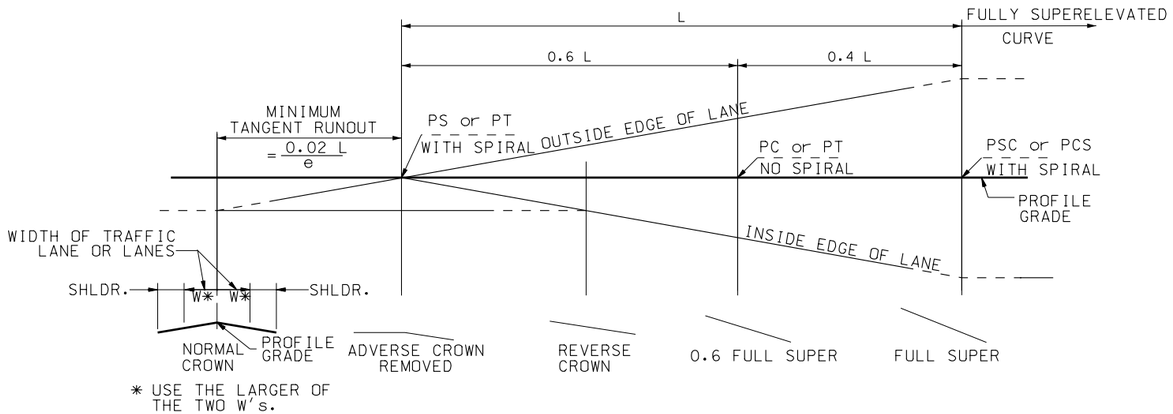
15-JUL-2003



PROFILE – SINGLE CROWN ROAD

(FOR ONE-DIRECTION ROADWAY CROSS SECTION ONLY)



PROFILE – DOUBLE CROWN ROAD

LEGEND:

PS = POINT OF SPIRAL

PT = POINT OF TANGENCY

PC = POINT OF CURVATURE

PSC = POINT OF SPRIAL TO CURVE

PCS = POINT OF CURVE TO SPIRAL

e = SUPERELEVATION – %

W = CROSS SECTIONAL DISTANCE IN FEET FROM AXIS OF ROTATION (NORMALLY THE CONTROL LINE) TO THE OUTER EDGE OF THE TRAFFIC LANE OR LANES.

L = MINIMUM SUPERELEVATION RUNOFF LENGTH

NOTES

1. USE CURRENT EDITION OF AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS.
2. USE CURRENT EDITION OF AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS.
3. SPIRALS WITH CURVES ARE NOT REQUIRED BUT MAY BE DESIRABLE UNDER HIGH SPEEDS AND SHARP CURVES. WHEN A SPIRAL IS USED, THE LENGTH OF SPIRAL IS EQUAL TO MINIMUM SUPERELEVATION RUNOFF LENGTHS.
4. SUPERELEVATE SURFACED SHOULDERS AT SAME RATE AS TRAFFIC LANES.
5. PLACE THE FOLLOWING INFORMATION ON THE CONSTRUCTION PLANS.
   RATE OF SUPERELEVATION
   BEGIN AND END OF TANGENT RUNOUT
   BEGIN AND END OF SUPERELEVATION RUNOFF IF SPIRALS ARE NOT USED

REVISIONS

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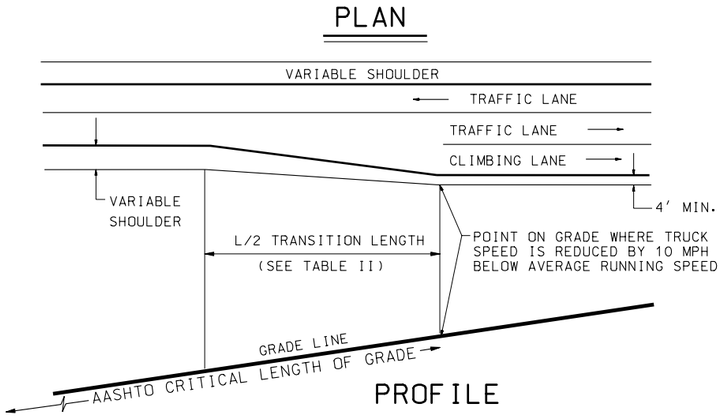
DEPUTY DIRECTOR

SUPERELEVATION AND WIDENING

STANDARD DRAWING TITLE

STD. DWG. NO.
DD 1



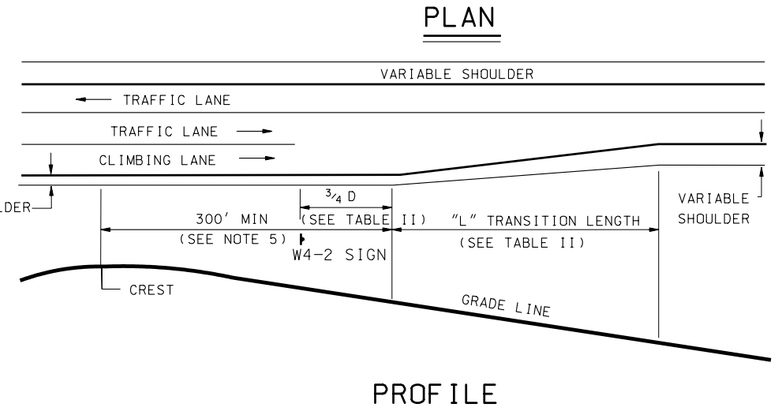


TABLE I

THE FOLLOWING THREE CRITERIA, REFLECTING ECONOMIC CONSIDERATIONS, SHOULD BE SATISFIED TO JUSTIFY A CLIMBING LANE:

1. UPGRADE TRAFFIC FLOW RATE IN EXCESS OF 200 VEHICLES PER HOUR
2. UPGRADE TRUCK FLOW RATE IN EXCESS OF 20 VEHICLES PER HOUR
3. ONE OF THE FOLLOWING CONDITIONS EXISTS:
   - A. A 10 MPH OR GREATER SPEED REDUCTION IS EXPECTED FOR A TYPICAL HEAVY TRUCK.
   - B. LEVEL OF SERVICE E or F EXISTS ON THE GRADE
   - C. A REDUCTION OF TWO OR MORE LEVELS OF SERVICE IS EXPERIENCED WHEN MOVING FROM THE APPROACH SEGMENT TO THE GRADE

TABLE II

DESIGN SPEED MPH	L* FT	L/2* FT	D FT
25	125	65	250
30	180	90	325
35	245	125	400
40	320	160	475
45	540	270	550
50	600	300	625
55	660	330	700
60	720	360	775
65	780	390	850
70	840	420	925

* BASED ON 12' TRAFFIC LANE WIDTH
"D" DISTANCE MAY PLACE W4-2 SIGN PRIOR TO CREST

NOTES:

1. USE THE CURRENT EDITION OF AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS.
2. USE THE CURRENT EDITION OF AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS.
3. CALCULATE CLEAR ZONE FROM SHOULDER LINE OF CLIMBING LANE.
4. USE CLIMBING LANE ON 2 LANE ROADWAY WHEN CRITERIA OF TABLE I IS MET.
5. EXTEND CLIMBING LANE A MINIMUM OF 300 FEET OVER CREST, PROVIDED MINIMUM PASSING SIGHT DISTANCE IS AVAILABLE. EXTEND THE CLIMBING LANE TO THE POINT WHERE MINIMUM PASSING SIGHT DISTANCE BECOMES AVAILABLE IF PASSING SIGHT DISTANCE IS RESTRICTED DUE TO HORIZONTAL OR VERTICAL ALIGNMENT, PROVIDED TRUCK SPEED IS LESS THAN 10 MPH BELOW AVERAGE RUNNING SPEED AT THAT POINT. OTHERWISE, EXTEND CLIMBING LANE TO THE POINT WHERE MINIMUM TRUCK SPEED IS EXCEEDED.
6. USE CLIMBING LANE ON MULTI-LANE ROADWAY WHEN TRUCK SPEED IS REDUCED 10 MPH BELOW AVERAGE RUNNING SPEED AND, AFTER ASSIGNING ALL PASSENGER VEHICLES TO THE INNER LANE(S), THE VOLUME EXCEEDS THE DESIGN CAPACITY OF THE REMAINING LANE(S).
7. USE CONTINUOUS CLIMBING LANES WHEN TWO OR MORE CLIMBING LANE SECTIONS ARE JUSTIFIED IN CLOSE PROXIMITY, AND THE GAP BETWEEN THE SECTIONS WOULD BE LESS THAN 1/2 MILE IN LENGTH.
8. OMIT CLIMBING LANES OF LESS THAN 1000'.
9. PROVIDE A MINIMUM OF 1000' PASSING LANE FOR EACH 1 MILE SECTION WHERE THERE IS NO PASSING SIGHT DISTANCE AND DHV EXCEEDS 80.

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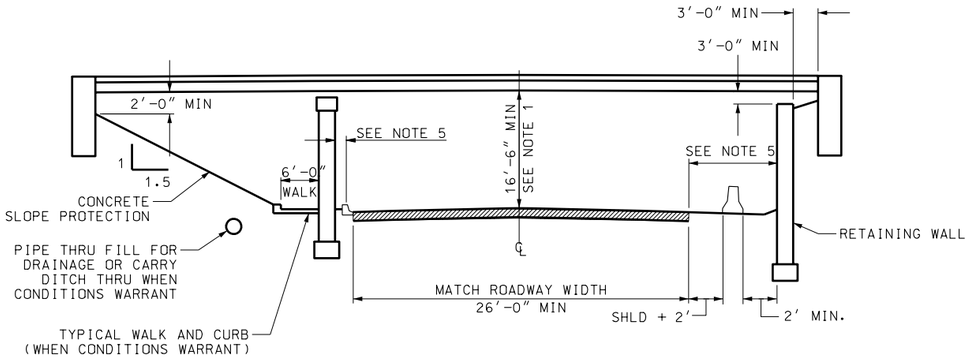
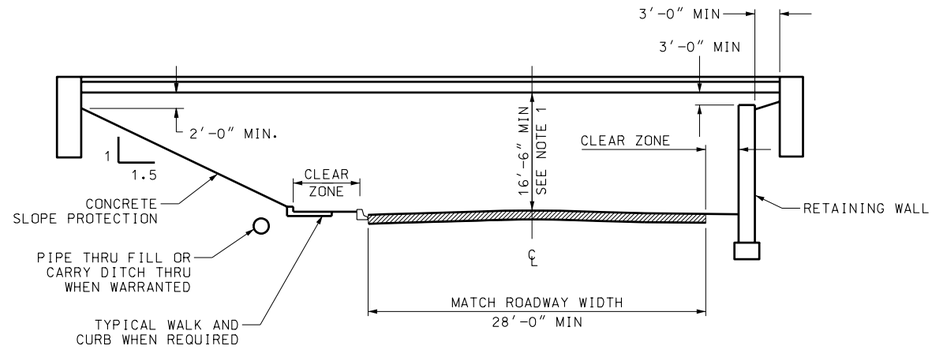
STANDARD DRAWING TITLE
CLIMBING LANES

STD. DWG. NO.
DD 3



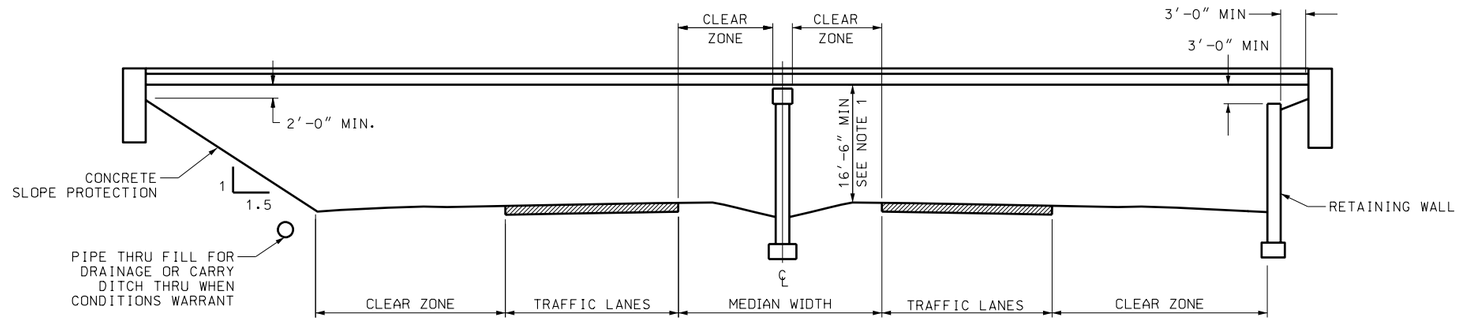
MINIMUM UNDERPASS CLEARANCE

(OTHER THAN FREEWAY OR MAJOR HIGHWAY)



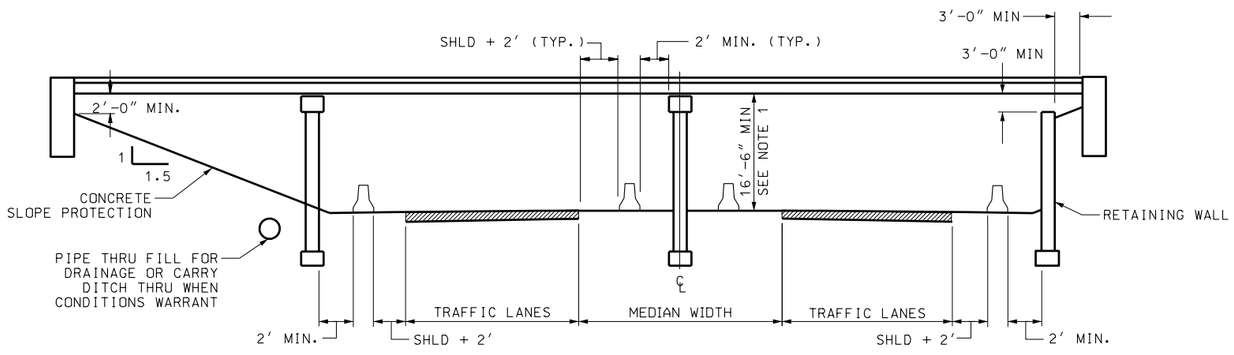
PREFERRED UNDERPASS CLEARANCE

(OTHER THAN FREEWAY OR MAJOR HIGHWAY)



PREFERRED UNDERPASS CLEARANCE

(FREEWAY OR MAJOR HIGHWAY)



MINIMUM UNDERPASS CLEARANCE

(FREEWAY OR MAJOR HIGHWAY)

NOTES:

1. A RANGE OF 6 INCHES WILL BE ALLOWED ABOVE THE MIMIMUM CLEARANCE SHOWN EXCEPT WHEN OTHER GEOMETRIC CONSIDERATIONS GOVERN.
2. PROVIDE ADEQUATE PROTECTION FOR OBSTRUCTIONS WITHIN THE CLEAR ZONE.
3. PROVIDE A MINIMUM OF 17′ 6″ VERTICAL CLEARANCE FOR PEDESTRIAN OVERPASSES AND OVERHEAD SIGN STRUCTURES.
4. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS.
5. FOR:
   - 40 MPH AND UNDER
     - USE 4′-0″ MINIMUM WITH CURB
     - USE 1/2 CLEAR ZONE WITHOUT CURB
   - 45 MPH AND ABOVE
     - USE CLEAR ZONE OR BARRIER

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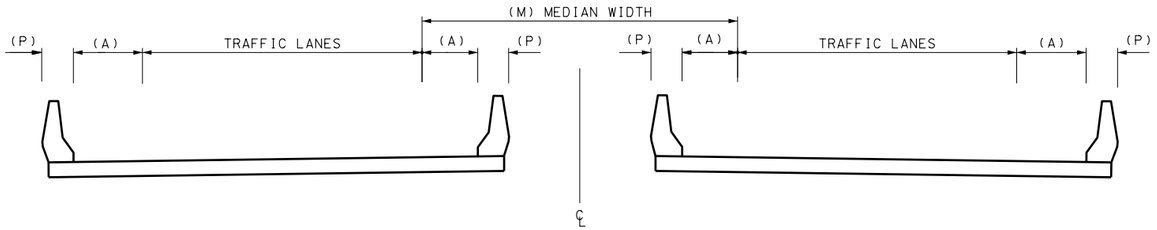
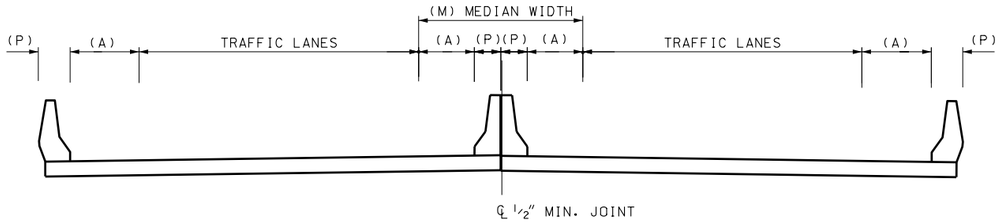
STRUCTURAL GEOMETRIC DESIGN STANDARDS CLEARANCES

STANDARD DRAWING TITLE

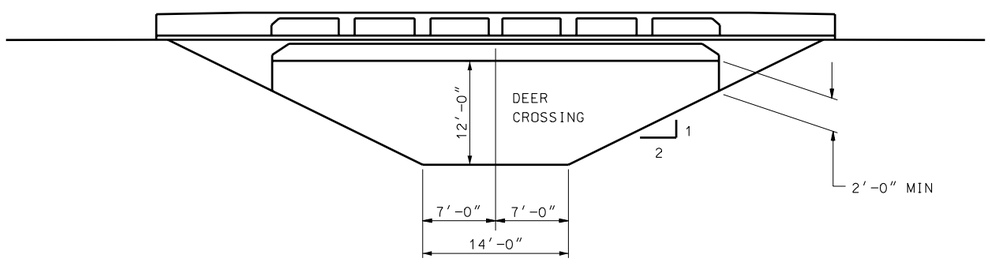
STD. DWG. NO.
DD 8



STRUCTURE CROSS SECTION
(OPEN MEDIAN)



STRUCTURE CROSS SECTION
(CLOSED MEDIAN)



DEER CROSSING
(TYP.)
NON VEHICULAR

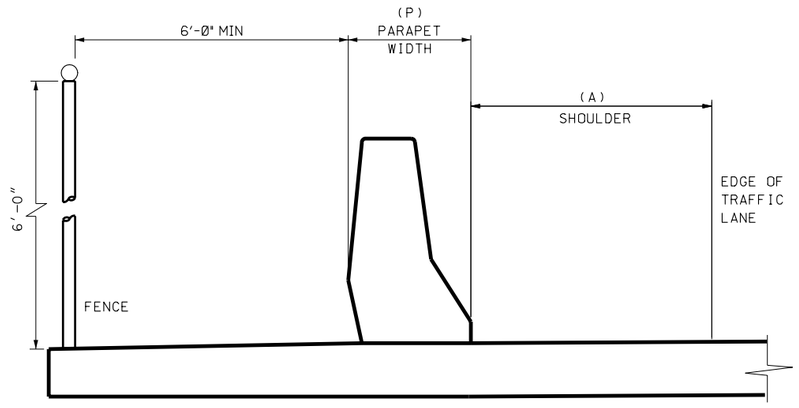
LEGEND

(A) NORMAL SHOULDER PLUS 2'-0" FOR BARRIER OFFSET ON ALL ROADS AND RAMPS.

FOR TWO WAY SINGLE STRUCTURE MATCH ROADWAY WIDTH PLUS 2'-0" BARRIER OFFSET EACH SIDE.

(M) WHEN MEDIAN WIDTH IS LESS THAN 30'-0" USE CLOSED MEDIAN STRUCTURE.

(P) PARAPET DIMENSION CONTROLLED BY SPECIFIC DESIGN.



SIDEWALK GEOMETRIC

REVISIONS

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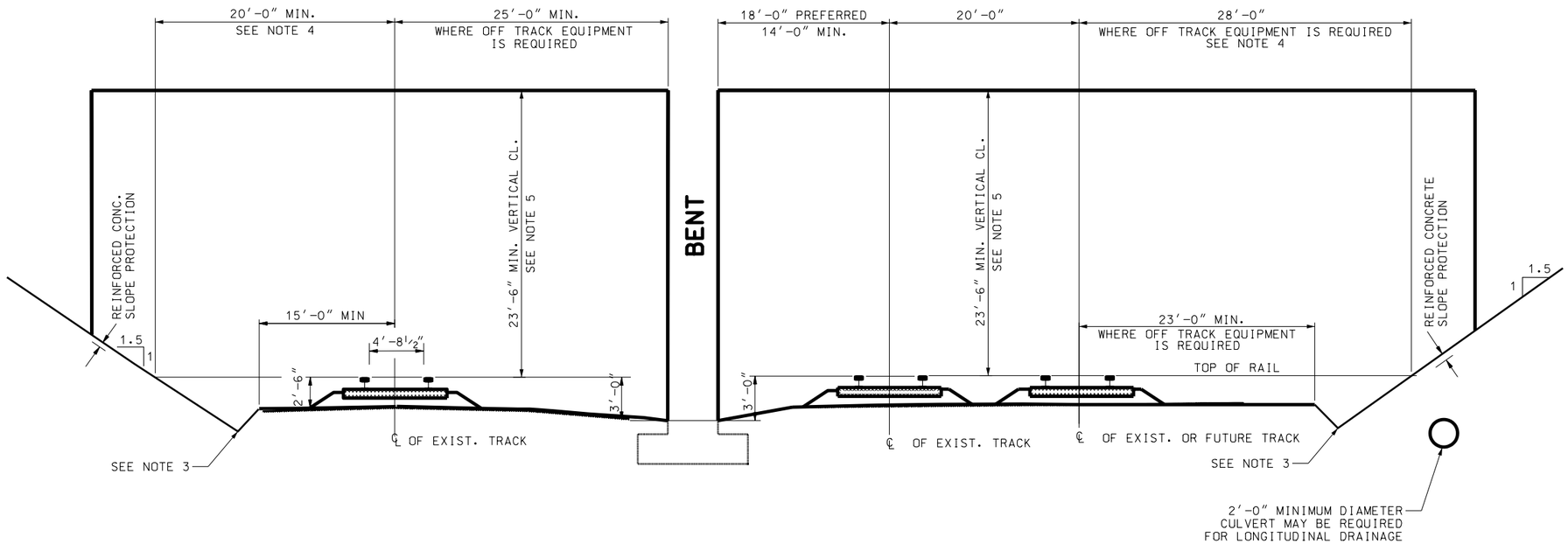
STANDARD DRAWING TITLE
STRUCTURAL GEOMETRIC DESIGN STANDARDS

STD DWG
DD 9



NOTES:

1. THE DIMENSIONS SHOWN CONTROL THE TOE OF THE SLOPES.

2. HORIZONTAL CLEARANCES SHOWN ARE NORMAL TO THE CENTERLINE OF THE TRACK. USE REDUCED CLEARANCES WHEN REQUIRED BY SPECIAL CONDITIONS AND WITH APPROVAL OF THE RAILROAD INVOLVED.

3. DETERMINE THE SIZE OF THE CUT DITCH BY A HYDRAULIC ANALYSIS.

4. INCREASE DISTANCE AT INDIVIDUAL STRUCTURE LOCATIONS AS APPROPRIATE TO PROVIDE FOR UNUSUAL DRAINAGE, OR SNOW STORAGE.

    a. PIPE THE CUT DITCH OR INCREASE THE DISTANCE TO ACCOMMODATE A LARGER CHANNEL IF JUSTIFIED BY HYDRAULIC ANALYSIS.
    b. INCREASE THIS DISTANCE TO PROVIDE SPACE FOR HEAVY OR DRIFTING SNOW IF JUSTIFIED BY THE RAILROAD.

5. A RANGE OF 6″ WILL BE ALLOWED ABOVE THE MINIMUM VERTICAL CLEARANCE SHOWN EXCEPT WHEN OTHER GEOMETRIC CONSIDERATIONS GOVERN.

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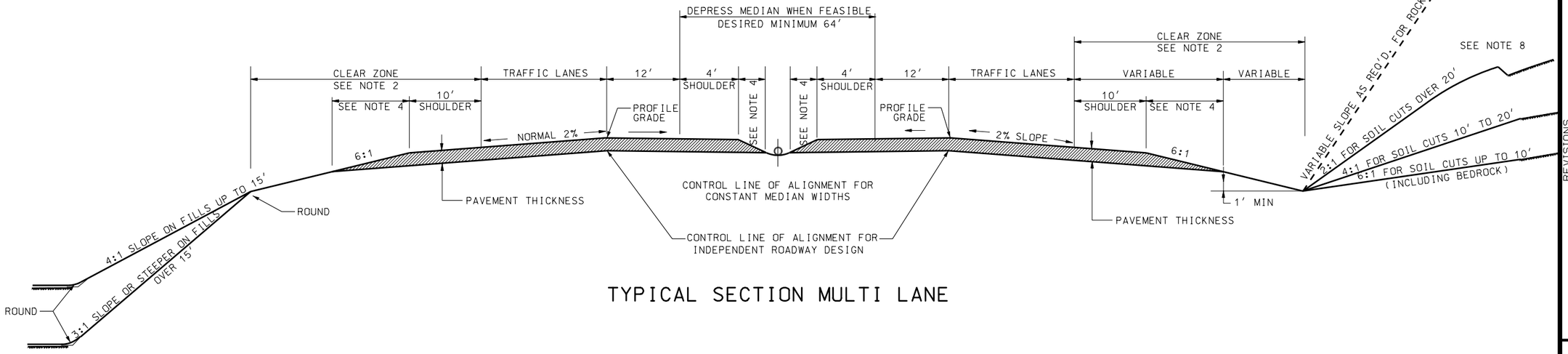
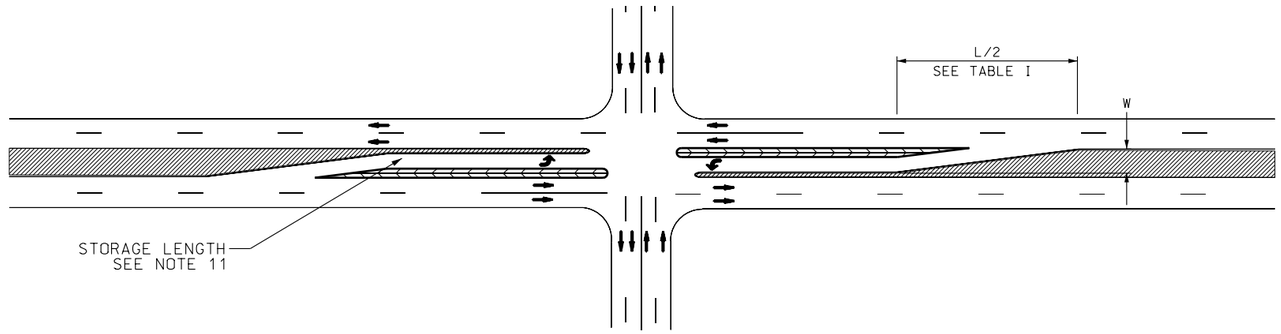
RAILROAD CLERANCES AT HIGHWAY OVERPASS STRUCTURES

STANDARD DRAWING TITLE

STD DWG
DD 10



TYPICAL SECTION MULTI LANE



TYPICAL MEDIAN LEFT TURN LANE
FOR MEDIANS GREATER THAN 28'

TABLE I	
SPEED	FORMULA
FOR SPEEDS OF 40 MPH AND LESS	$L = \frac{WS^2}{60}$
FOR SPEEDS OF 45 MPH AND GREATER	L = WS

WHERE:
L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = SPEED IN MPH

NOTES:

1. USE THE CURRENT EDITION OF AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS.
2. USE THE CURRENT EDITION OF AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS. CLEAR ZONE MAY INCLUDE CUT OR FILL SLOPES.
3. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDTIONS PERMIT.
4. MAINTAIN A CONSTANT WIDTH TO THE NEAREST 1/2 FOOT EVEN UNDER CONDITIONS OF MAXIMUM SUPERELEVATION PROVIDING A SLOPE OF 6:1 OR FLATTER IN A NORMAL SECTION WITH A 2 PERCENT SLOPE.
5. PROVIDE BACKSLOPE ROUNDING FOR ALL CUTS STEEPER THAN 4:1 AS PER ROUNDING DETAIL, STD DWG DD-2.
6. TRANSITION FROM FLAT TO STEEPER CUT AND FILL SLOPES IN SUFFICIENT DISTANCE TO PROVIDE A NATURAL PLEASING APPEARANCE.
7. PAVEMENT THICKNESS CONSISTS OF UTBC AND HARD SURFACING ONLY.
8. INSTALL SURFACE DITCH WHEN SURFACE DRAINAGE IS TOWARDS CUT. SURFACE DITCH MUST DRAIN TO NATURAL DRAINAGE OR TO ROADSIDE DITCH.
9. SEE STD DWG DD-4 FOR TYPICAL DETAILS FOR SECTION ON CURVE AND SECTION ON TANGENT. SEE STD DWG DD-2 FOR TYPICAL SECTION ON DITCH FLARING AND BENCHED SLOPE.
10. USE FLAT MEDIAN WHERE MEDIAN IS NOT OF SUFFICIENT WIDTH TO PROVIDE A DEPTH OF 1 FOOT BELOW THE PAVEMENT THICKNESS. REDUCE SLOPE TO 10:1 OR LESS AND PAVE THE ENTIRE AREA.
11. USE A CAPACITY ANALYSIS TO DETERMINE THE LENGTH OF STORAGE REQUIRED FOR TURN LANE. A MINIMUM LENGTH OF 100 FEET IS REQUIRED.

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — JUN.26.2003 DATE

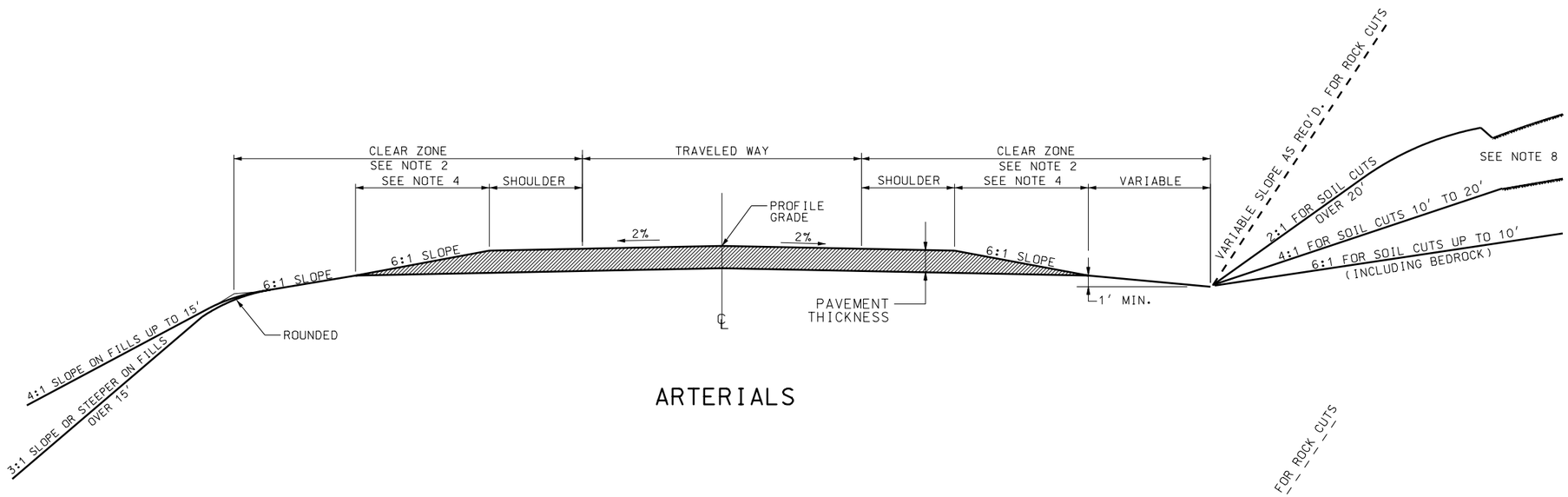
CHAIRMAN STANDARDS COMMITTEE
APPROVED — JUN.26.2003 DATE

DEPUTY DIRECTOR

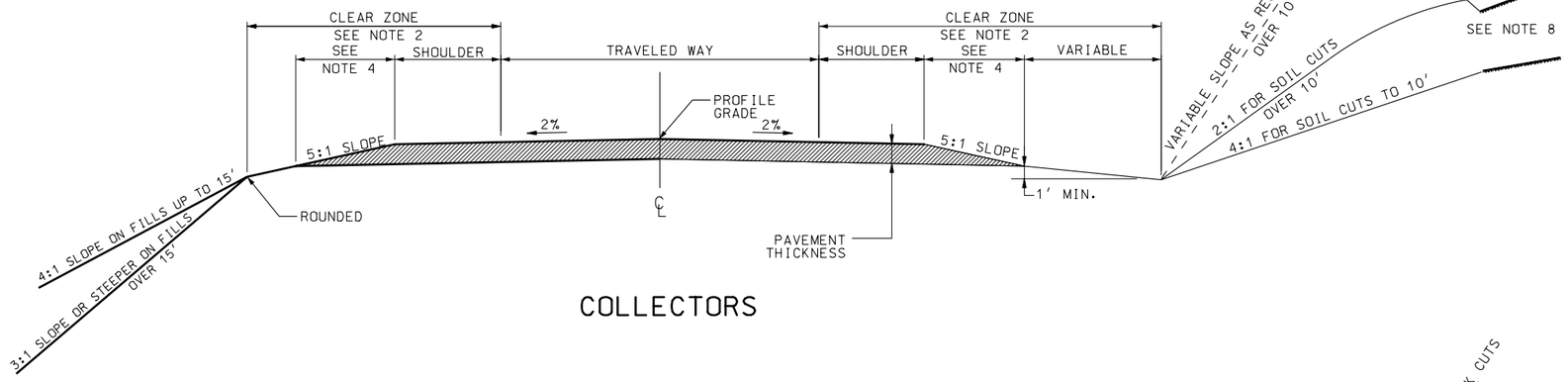
RURAL
MULTI LANE HIGHWAYS
OTHER THAN FREEWAYS

STANDARD DRAWING TITLE

STD. DWG. NO.
DD 11



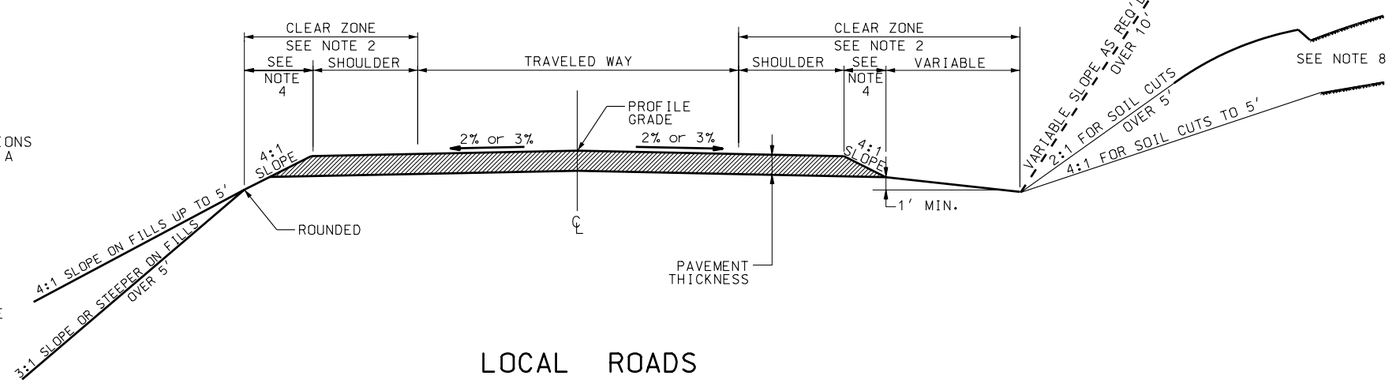
ARTERIALS



COLLECTORS

NOTES:

1. USE CURRENT EDITION OF THE AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS.
2. USE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS. CLEAR ZONE MAY INCLUDE CUT OR FILL SLOPES.
3. STANDARDS SHOWN ARE RECOMMENDED VALUES. EXCEED STANDARDS IF CONDITIONS PERMIT.
4. MAINTAIN CONSTANT WIDTH TO THE NEAREST 1/2 FT. EVEN UNDER CONDITIONS OF MAXIMUM SUPERELEVATION PROVIDING A CONSTANT SLOPE OR FLATTEN IN A NORMAL SECTION WITH A 2 PERCENT SLOPE.
5. PROVIDE BACKSLOPE ROUNDING FOR ALL CUTS STEEPER THAN 4:1 AS PER ROUNDING DETAIL, STD DWG DD-2.
6. TRANSITION FROM FLAT TO STEEPER CUT AND FILL SLOPES IN SUFFICIENT DISTANCE TO PROVIDE A NATURAL PLEASING APPEARANCE.
7. PAVEMENT THICKNESS CONSISTS OF UTBC AND HARD SURFACING ONLY.
8. INSTALL SURFACE DITCH WHEN SURFACE DRAINAGE IS TOWARDS CUT. SURFACE DITCH MUST DRAIN TO NATURAL DRAINAGE OR TO ROADSIDE DITCH.
9. SEE STD DWG DD-4 FOR TYPICAL DETAILS FOR SECTION ON CURVE AND SECTION ON TANGENT. SEE STD DWG DD-2 FOR TYPICAL SECTIONS ON DITCH FLARING AND BENCHED SLOPE.
10. USE A MINIMUM 0.3 PERCENT PROFILE GRADE THROUGHOUT CUT OR CURBED SECTIONS. LEVEL GRADES PERMITTED ON FILL SECTIONS.



LOCAL ROADS

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

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SALT LAKE CITY, UTAH

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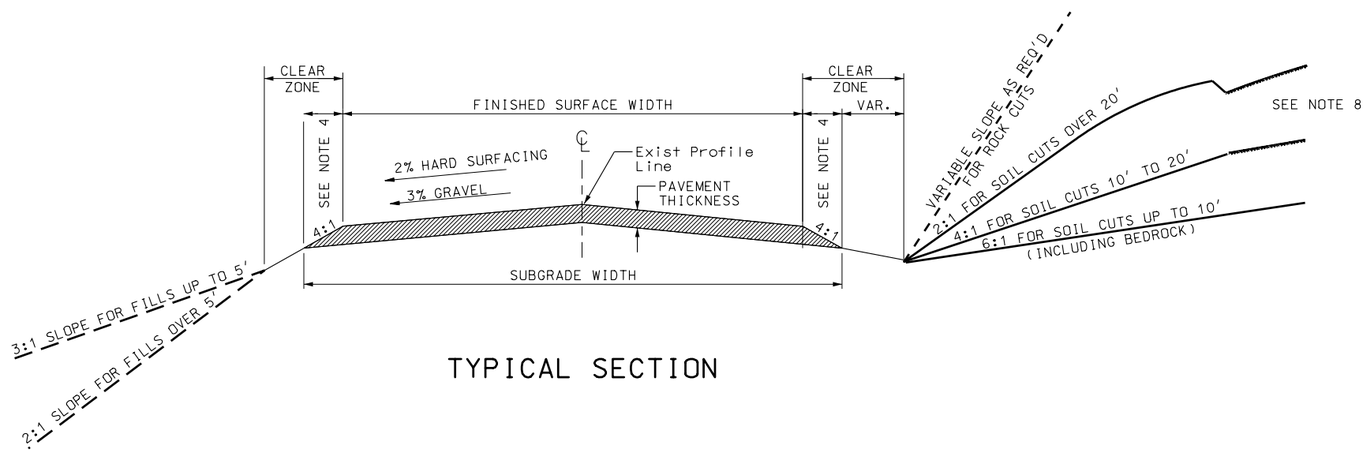
CHAIRMAN STANDARDS COMMITTEE
APPROVED — JUN.26.2003 DATE

DEPUTY DIRECTOR

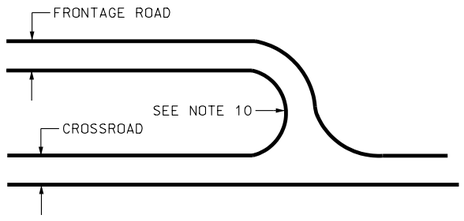
RURAL TWO LANE HIGHWAYS

STANDARD DRAWING TITLE

STD. DWG. NO.
DD 12



TYPICAL SECTION



INTERSECTION OF
FRONTAGE ROAD AND CROSSROAD

NOTES:

1. USE THE CURRENT EDITION OF AASHTO A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS FOR DESIGN OF ROADWAY ELEMENTS.
2. USE THE CURRENT EDITION OF AASHTO ROADSIDE DESIGN GUIDE FOR CLEAR ZONE REQUIREMENTS. CLEAR ZONE MAY INCLUDE CUT AND FILL SLOPES.
3. STANDARDS SHOWN ARE RECOMMENED VALUES. EXCEED STANDARDS IF CONDTIONS PERMIT.
4. MAINTAIN A CONSTANT WIDTH TO THE NEAREST 1/2 FOOT EVEN UNDER CONDITIONS OF SUPERELEVATION PROVIDING A SLOPE OF 4:1 OR FLATTER IN A NORMAL SECTION WITH A 2 PERCENT OR 3 PERCENT SLOPE.
5. PROVIDE BACKSLOPE ROUNDING FOR ALL CUTS STEEPER THAN 4:1 AS PER ROUNDING DETAIL, STD DWG DD-2.
6. TRANSITION FROM FLAT TO STEEPER CUT AND FILL SLOPES IN SUFFICIENT DISTANCE TO PROVIDE A NATURAL PLEASING APPEARANCE.
7. PAVEMENT THICKNESS CONSISTS OF GRAVEL OR UTBC AND HARD SURFACING ONLY.
8. INSTALL SURFACE DITCH WHEN SURFACE DRAINAGE IS TOWARDS CUT. SURFACE DITCH MUST DRAIN TO NATURAL DRAINAGE OR TO ROADSIDE DITCH.
9. SEE STD DWG DD-4 FOR TYPICAL DETAILS FOR SECTION ON CURVE AND SECTION ON TANGENT. SEE STD DWG DD-2 FOR TYPICAL SECTION ON DITCH FLARING AND BENCHED SLOPE.
10. DESIGN FRONTAGE ROAD WITH A MINIMUM TURNING RADIUS OF 60 FEET AT INTERSECTIONS. A TURNING RADIUS OF 50 FEET MAY BE USED WHERE NO REGULAR LARGE VEHICLE MOVEMENTS ARE EXPECTED.

REVISIONS

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
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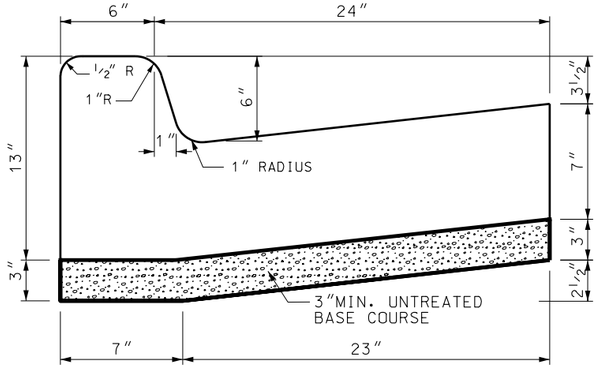
DEPUTY DIRECTOR

FRONTAGE AND ACCESS ROADS (UNDER 50 ADT)

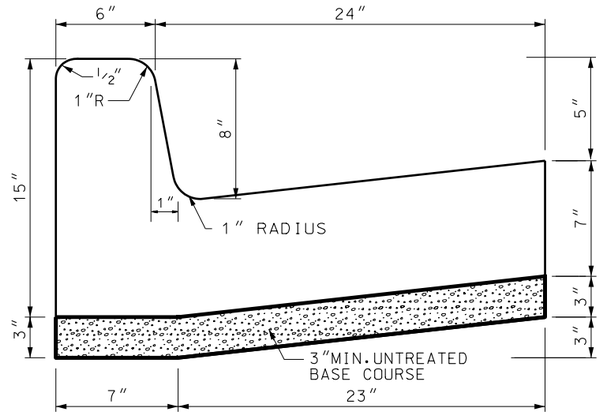
STANDARD DRAWING TITLE

STD. DWG. NO.
DD 13



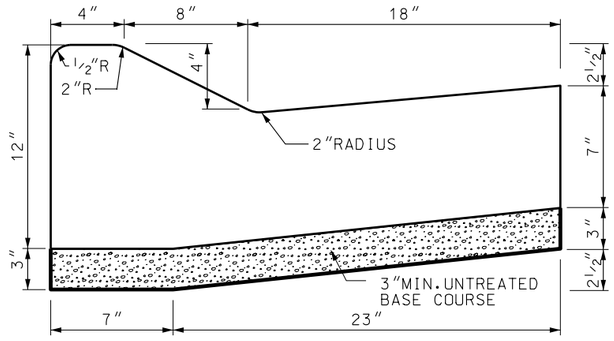
TYPE B1

CURB & GUTTER
AREA = 1.680 SQ.FT.



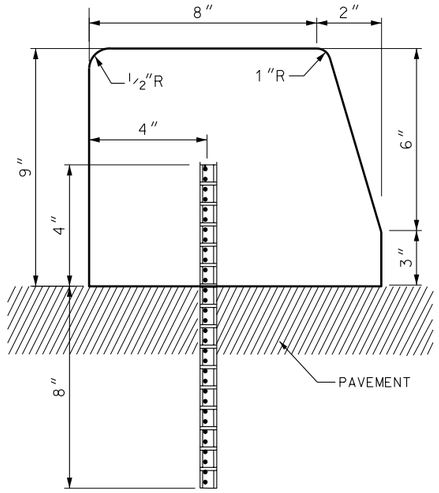
TYPE B2

CURB & GUTTER
AREA = 1.765 SQ.FT.



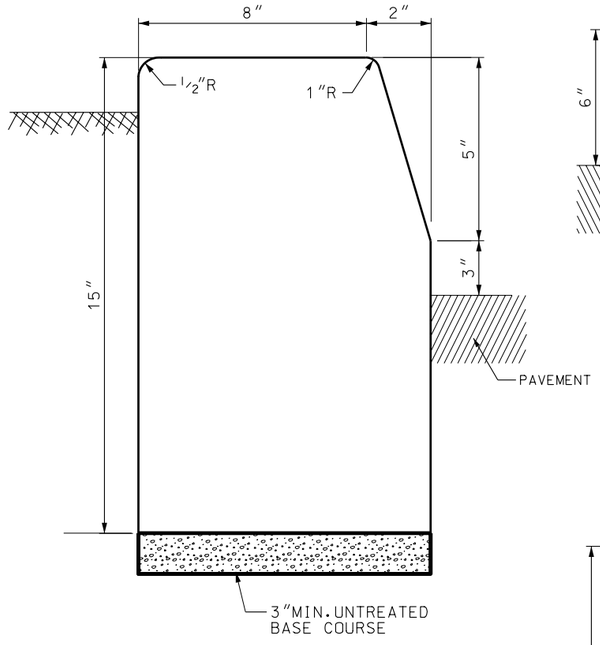
TYPE M1

CURB & GUTTER
AREA = 1.700 SQ.FT.



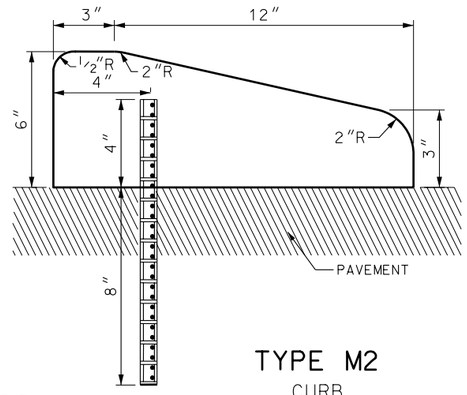
TYPE B3

CURB
AREA = 0.580 SQ.FT.



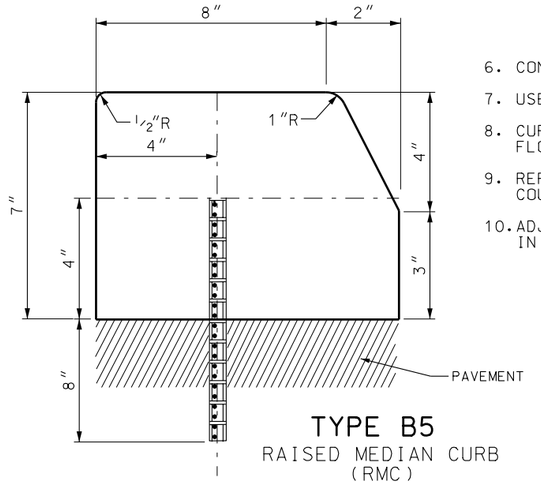
TYPE B4

CURB
AREA = 1.033 SQ.FT.



TYPE M2

CURB
AREA = 0.484 SQ.FT.



TYPE B5

RAISED MEDIAN CURB
(RMC)
AREA = 0.490 SQ.FT.

NOTES:

1. DRAINAGE CURBS: TYPE B1,B2 & M1
2. MOUNTABLE CURBS: TYPES M1 & M2 FOR APPLICATION REFER TO THE AASHTO POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS.
3. CURBS TYPES B1, B2, B3, B4 & B5 USED WITH DESIGN SPEED UP TO 40 MPH EXCEPT IN PREDOMINATELY URBAN OR RAPIDLY DEVELOPING RURAL AREAS WHERE CURB MAY BE USED WITH DESIGN SPEEDS UP TO 50 MPH.
4. DOWELS: 3/4" DEFORMED BARS ON 5' MAX.CENTERS.
5. PRECAST CURBS:
   A. MINIMUM OF 10' IN LENGTH.
   B. DOWELS AT A MINIMUM OF 3 PER 10' LENGTH.
   C. INCLUDE ADEQUATE REINFORCING STEEL TO WITH STAND HANDLING STRESSES.
6. CONCRETE CLASS AA "AE"
7. USE TYPE B4 ONLY AS BORDER CURB.
8. CURB HEIGHT IS MEASURED VERTICALLY FROM THE FLOW LINE OF THE GUTTER TO TOP BACK OF CURB.
9. REFER TO ROADWAY PLANS FOR UNTREATED BASE COURSE SIZE.
10. ADJUST CURB FACE TO 4"MAXIMUM HEIGHT WHEN USED IN CONJUNCTION WITH GUARDRAIL BARRIER.

REVISIONS

NO.	DATE	APPR.	REMARKS
1	02/20/03	J.L.	REVISED NOTE 2, ADDED PAVEMENT LEADER TO TYPE B2, B3, AND B5.
2	04/24/03	J.L.	ADDED NOTE 10
3	06/10/03	F.W.	CORRECTED NOTE 3 ELIMINATING THE WORD "BARRIER"

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DEPUTY DIRECTOR

CONCRETE CURB & GUTTER

STANDARD DRAWING TITLE

STD DWG
GW 2

DGN File:N:\Esd\Standard Drawings\Imperial\Approved\Change4Approved\gw02.dgn
15-JUL-2003